

# **Paddy Supply Chain: A Case of Paddy Industry in Kelantan**

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## **Abstract**

The production of paddy and the supply of rice to the consumers should not be viewed as separate segments but as a series of linked segments within a supply chain model. It involved of both upstream and downstream linkages. Each linkage has different processes and activities that produce different value and form of products and services before it reaches to the final customer or consumer. The paddy supply chain in Kelantan starts with the paddy producers (farmers), to the rice millers, then to the traders who will hand it to the wholesale traders, and lastly to the final consumers. A strong linkage between actors in every stage of supply chain can guarantee a competitive production and efficient distribution of paddy and rice from farmers to the final consumers.

**Keyword:** Farmers, KADA, Paddy Industry, Supply Chain

## **1. Introduction**

A supply chain is a network of organizations that involved of both upstream and downstream linkages. Each linkage has different processes and activities that produce different value and form of products and services before it reaches to the final customer or consumer (Hui Nee, 2008). The network consists of either connected or interdependent organisations. Upstream linkages relate to the relationships between an organisation and its suppliers while downstream relates to the relationship between an organization and its customers. Linkages are the coordination of supply chain processes. A process is a structure of action and a specific work activity with a beginning and an ending process. It also clearly identifies its inputs and outputs (Senanayake & Premaratne, 2016). The success of a supply chain is due to priorities given to quality, price, timely delivery and relationships with suppliers. The key is to understand what the customer wants other than where, when, how much and at what price, and respond to it accurately, speedily and with minimum flow of materials (Hui Nee, 2008).

The production of paddy and the supply of rice to the consumers should not be viewed as separate segments but as a series of linked segments within a supply chain model. For domestic paddy production, Malaysia relies primarily on key granary areas. Approximately 70% of the domestic supply is from the granary areas. Therefore, the performance of the national paddy production is often a reflection of the performance of the granary areas in Malaysia (Department of Agriculture, 2015).

Paddy and rice supply chain is a complex relationship between public and private entities that its link start with the rice producers (farmers), to the rice millers, then to rice collectors and traders who will handed it to the wholesale traders, then to retailers and food processors and lastly to the final consumers (Muthayya, Jonathan, Scott, & Glen, 2014).

The flow of paddy supply chain starts from farming activities and end with consumption of rice by the consumers. The farmers can be categorized by the land holding either small, medium or large scale. Usually, small scale farmers produce enough rice for their own stock while for the medium or large scale will sell directly to the local miller.

Based on 2016 data and research carried out by Khazanah Research Institute (KRI), the paddy and rice supply chain involved of a large number of farmers, consumers and a small number of midstream players. The typical flow in the production of paddy described by Omar, Shaharudin and Tumin (2019, p. 19) in their research was as follows:

*194,931 farmers in Malaysia produced a total 2.7m MT of paddy from around 68,000 MT of seeds. Once harvested, the paddy grains were sold to 157 millers at a Guaranteed Minimum Price (GMP) of RM1,200/MT, where they were processed into 1.8m MT of rice and subsequently distributed through retail stores via 1,660 active wholesalers. At 56,746 retail stores, rice was then sold to 31 million consumers with a total of 2.7m MT of rice consumed in 2016. This is more than the national domestic rice produced. The remaining 821,869 MT of demand for rice was fulfilled by importing rice, primarily from Thailand and Vietnam.*

To serve this study's objective, a case study was carried out in Kelantan. Kelantan was the second state came out with granary area in Malaysia after Kedah. Kemubu Agricultural Development Authority (KADA) was set up since 1968. The establishment of KADA is an effort to ensure the self-sufficient country is assuring other than to strengthen National Food Security as targeted under the Agro-Food Policy (2011-2020). The objectives of the study were to identify value addition of paddy by different actors and to examine the activities related to value addition of paddy supply chain.

## **2. Method**

Data were collected through observation of paddy farming activities in Kota Bharu Utara area. Informal interview has been done among local farmers to identify the basic information on paddy supply chain. Other than that, a focus discussion group also was held in KADA office which involved of 10 farmers and three KADA officers.

## **3. Finding**

The result of this research is discussed in term of stages involve in paddy supply chain and its main actors involved in every stage. Figure 1 below is a summary of paddy supply chain in Kelantan as per result from focus discussion group and model carried out by Khazanah Research Institute (KRI). The flow of paddy production start from input, production, milling, wholesale,

retail, trade and stockpile and end with consumption. Input suppliers are responsible to provide seed to farmers while farmers are the main actor who involve in production process. The milling process only start after harvesting period. After the milling process is done, rice will be distributed by wholesaler and retail. BERNAS was given sole importer rights to overcome shortage in rice consumption and to take care of stockpiling. Consumers can get variety of rice based on their preferences at any local store.

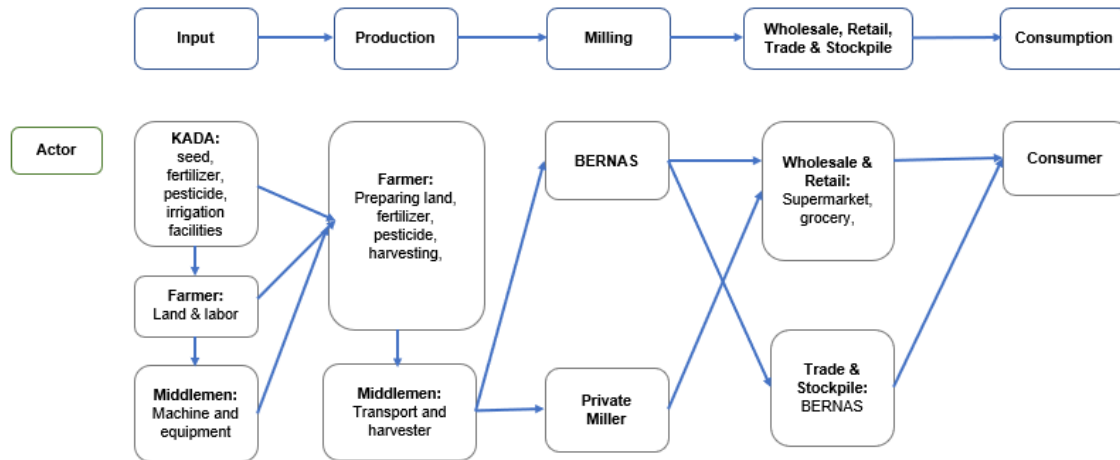


Fig. 1 Map of paddy supply chain in Kelantan

### 3.1 Input

The input segment of the paddy supply chain is an upstream segment that provides all the raw inputs needed to cultivate paddy. It includes the supply of seeds, fertilisers, pesticides, machinery and water and irrigation. This is a preproduction phase where land had to be prepared and need for a huge initial investment to improve the soil health and all other necessary inputs such as seed, fertilizer, pesticides, weeding equipment, labour and machineries.

For seed, farmers could outsource from KADA. Popular local varieties include MR 220 CL2, MR 219 and MR 263. Basically, a farmer uses around 140kg/Ha of seeds that cost around RM270/Ha and can yield between 2,000 to 8,000 MT/Ha depending on several interrelated factors such as soil condition, weather, pests and disease outbreaks, fertiliser, water and seed variety, and seed quality. The use of high-quality seeds is important for farm yield. For instance, seeds could be contaminated with diseases, be mixed with genetically impure seeds or have a low germination rate. All these contribute towards lowering farm yield. Indeed, varieties such as the MR 220 CL2 were meant to be short-term varieties to limit the growth of weedy rice. However, for various reasons, farmers refuse to use other available varieties (MR 253, MR 263, MR269 and MRQ 76) since they have lack of alternative varieties that can compete in term of maturity period and potential yield.

Only farmers who use certified seeds are eligible for input subsidies. The government introduced a seed incentive scheme for producers (RM1.03/kg) to ensure that they can earn a profit despite a seed price cap at RM1.40/kg. Other than seed incentive scheme, government also provide subsidy for fertilizers and pesticides under Federal Government Paddy Fertilizer Subsidy Scheme (SBPKP) and Paddy Production Incentives Scheme (SIPP).

Farmers also need help from middlemen, who also paddy farmers but they usually involved in large scale of production and own harvester and modern equipment.

### 3.2 Production

Since the production operated in small scale, farmer was able to handle small machinery and easy handling equipment such as paddy straw cutter, weeding machine and others during the production phases. Farmers usually purchase and utilize farm inputs to cultivate paddy plants within a period of 90 to 120 days. At production level, since the main actors are farmers who are associated with lower income group, it received a lot of government attention. Government has introduced many intervention measures compare to other segment in this supply chain such as Paddy Production Incentives Scheme which includes ploughing allowance, organic fertilizer, additional NS fertilizer and growth enhancer and Production Rice Incentives which include pesticide and additional NPK fertilizer (Omar, Shaharudin, & Tumin, 2019).

Based on KADA data, the average age of Kelantan farmers is 57 years old. It is commonly accepted that the productivity of a farmer improves through years of experience, but at certain level age, the productivity will decline as physical limitations increase. Better employment opportunities in urban areas can be associated with this ageing scenario in rural areas. As all know, younger farmers are more innovative and productive. They adopt better farm machinery, technology and show some improvements in farm management. They able to produce more than that the ageing farmers produce. The ageing farmers, with physical limitation, tend to work on smaller land areas (basically less than 3 ha) but the younger farmers, with the abilities to handle modern machinery and equipment, prefer to work on larger scale. The challenge, therefore, is to attract younger farmers to involve in paddy industry.

### 3.3 Milling

Once paddy was harvested, farmers or middleman will straight away sent to the nearest milling centre. They have option to sell the paddy either to BERNAS or private millers. In milling centre, paddy will go through drying and storage process to reduce the moisture content from 25% to approximately 13%. Then paddy will go through many other process such as milling, hulling and whitening before they are grading accordingly. The millers purchase the paddy at a price that is equal or higher than the Guaranteed Minimum Price (GMP) and process the paddy into rice.

Due to GMP standardization in 2014, many private millers in Kelantan were forced to shut down (Aziz, 2019). As a result, BERNAS had to buy paddy from farmers regardless of the quality. The biggest BERNAS miller in Kelantan located in Pasir Puteh. Two others located in Peringat, Kota Bharu and Tumpat respectively. Current GMP price is RM1,200 (since 2014) but the actual purchasing price varies across states. This is because some states such as Kelantan produced lower quality grains and, as such, it was priced below RM1,000/MT, while other states were able to sell their higher quality grains above RM1,000/MT. The differences in price make farmers look for another alternative of miller outside Kelantan. For those who have own transport, they are willing to sell their paddy to neighbourhood state, in this case, Kedah, since Kedah is the nearest state. The profit gain still can cover the cost of transportation.

### 3.4 Wholesale, Retail, Trade and Stockpile

Wholesale and retail activity purposely serve for local consumer by local supplier. Any shortage in demand will be fulfilled with imported rice. BERNAS is the only entity can do the stockpiling and import rice. Stockpiling is important in stabilizing domestic price fluctuations and as emergency reserve at least to meet country's demand for six months. BERNAS also responsible in distributing rice to license wholesalers through its subsidiary.

### 3.5 Consumption

The demand for rice is vary between consumers. Currently the trend of demand for rice is towards healthy and safety since some of consumers are very particular in their daily diets' calories taken. Consumer can get rice from any supermarket, grocery or shop lot based on their preference and purchasing power, either local brand of imported one. KADA might collaborate with MARDI to get varieties of fragrant rice such as MRQ 50, MARDI Wangi 74, MARDI Wangi 76 and MARDI Wangi 88 to meet the changes in demand by customers (Harun, Halim, Engku Ariff, & Serin, 2018).

## 4. Conclusion

A proper supply chain management framework is very essential for efficient sourcing, processing, distribution, and retailing and hence meeting the customer demands without facing a situation of lost sales. The process involves of many activities at every stage which affect the function of next stage and requires it to co-operate in the customised manner.

The main actor of paddy supply chain in Kelantan is farmers since they are the one who involve directly in paddy production. They need support from the government, in Kelantan case, they need KADA in supplying the seeds, fertilizers and pesticides through the subsidies provided by the government. Other than that, they also need middleman especially in term providing them with modern machinery, equipment and transportation that can help them reducing the cost of production. The middleman is also a paddy farmer but usually they involve in big scale of production. They have enough fund to have modern equipment compared to small scale farmers.

Farmers also need middleman in next stage of supply chain that is in transporting the paddy to the miller. The millers (BERNAS and other private millers) will do all the process of cleaning, husking, polishing and packaging before distributing it to the final consumers. Consumers can get the rice they preferred from retailers or supermarkets.

Apart of milling process, BERNAS also responsible in maintaining the nation's rice stockpile and the only entity can import rice. To protect local farmers, BERNAS's import volume only to cover the shortfall of demand. BERNAS will import the varieties that cannot be produced locally like basmati and fragrant rice to cater various preferences and taste of multi-racial society in Malaysia.

Overall, a strong linkage between farmers, middleman, the government and BERNAS can help in improving the competitiveness in paddy production.

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